Constructive Alignment of an introductory university Geographic Information Systems course

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Introduction

Framework for course development: Constructive Alignment

Course: GIS 1, a 2nd year course in a 4 year BSc Geomatics degree

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What is Constructive Alignment?

Framework for

"deriving curriculum objectives in terms of performances that represent a suitably high cognitive level, in deciding teaching/learning activities judged to elicit those performances, and to assess and summatively report student performance" (Biggs, 1996)

Guides the total learning experience

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Theoretical Framework

Constructivism

"learning is an active process of constructing rather than acquiring knowledge";

"instruction is a process of supporting that construction rather than communicating knowledge" (Duffy & Cunningham, 1996)

Student-centred learning to aid deep learning

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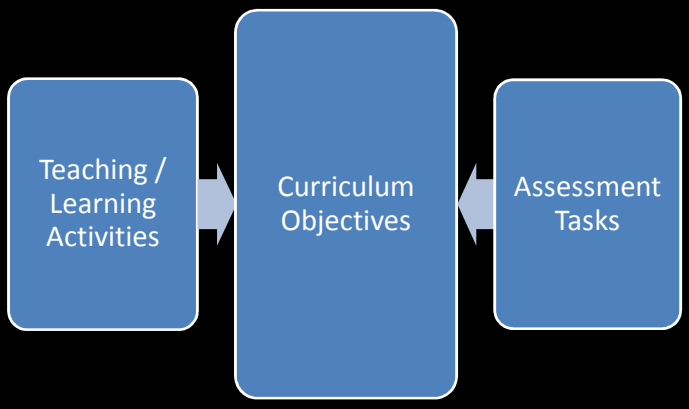
Constructive Alignment



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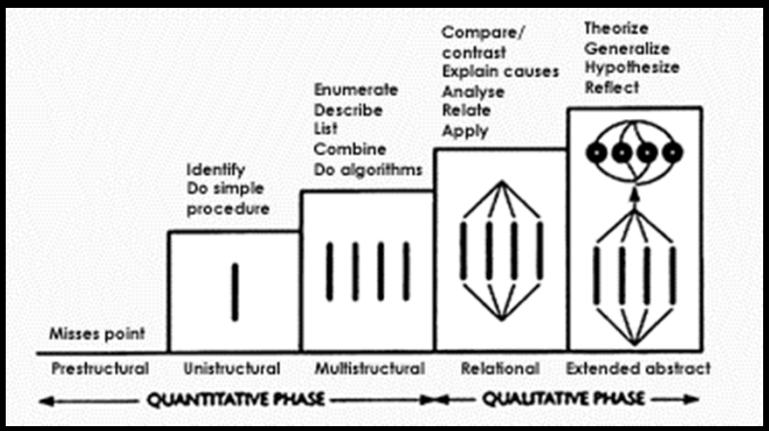
Levels of Understanding



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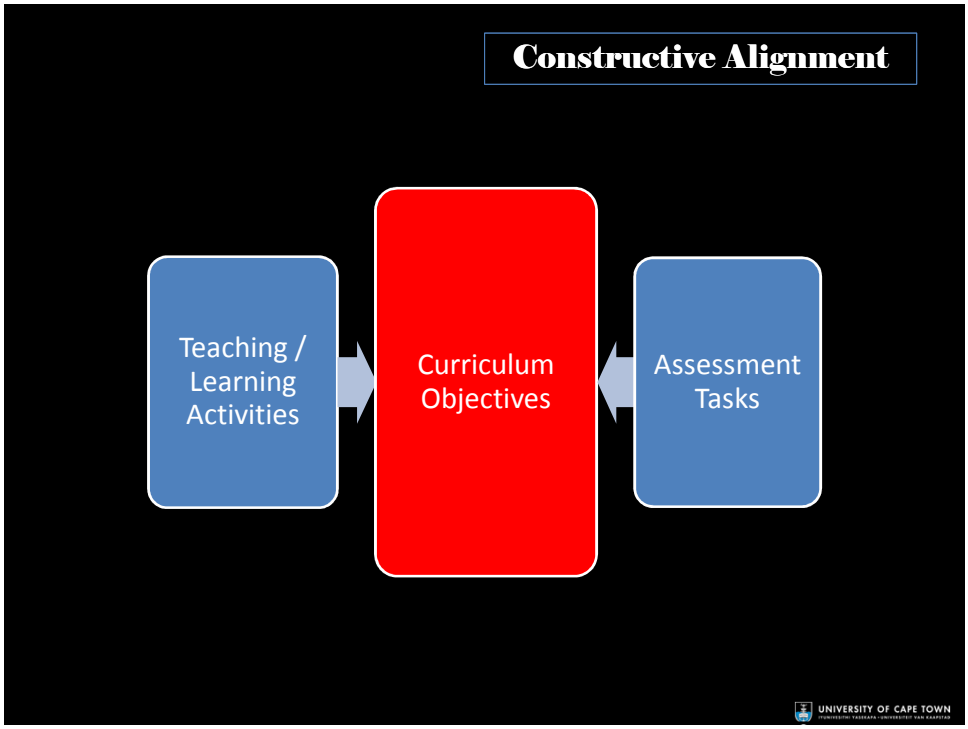
Constructive Alignment
Teaching / Learning Activities
Curriculum Objectives
Assessment Tasks
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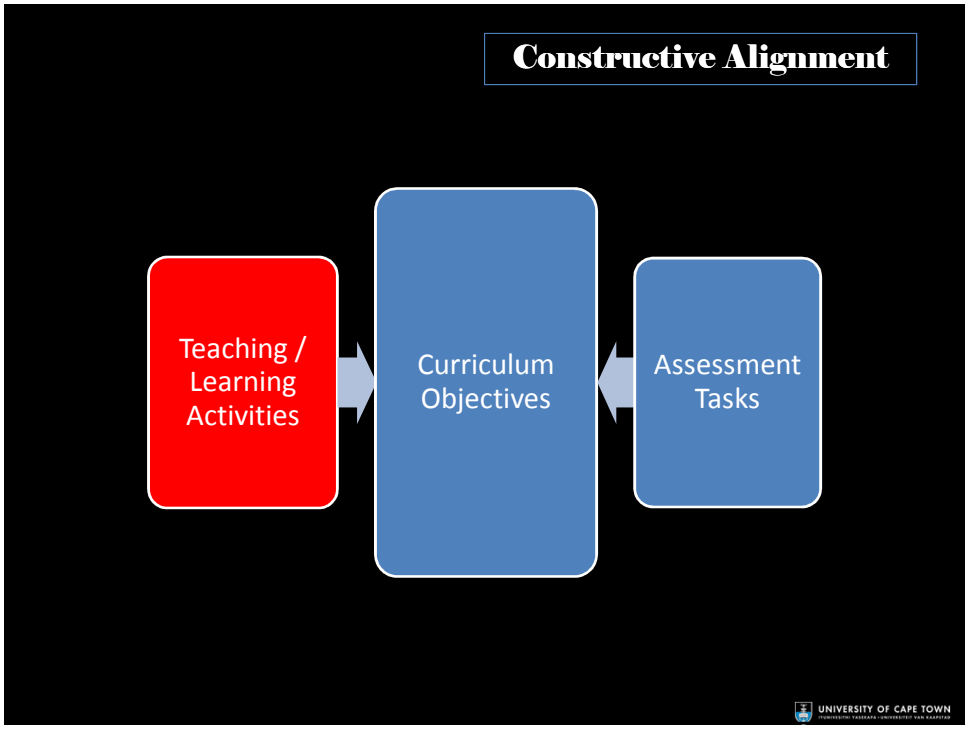
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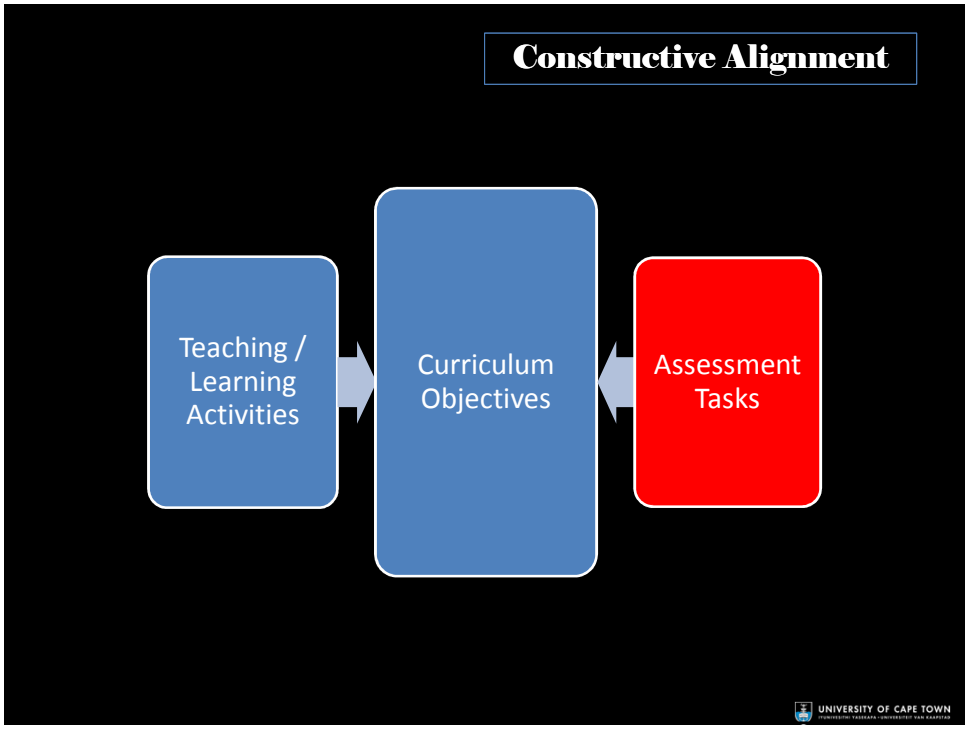
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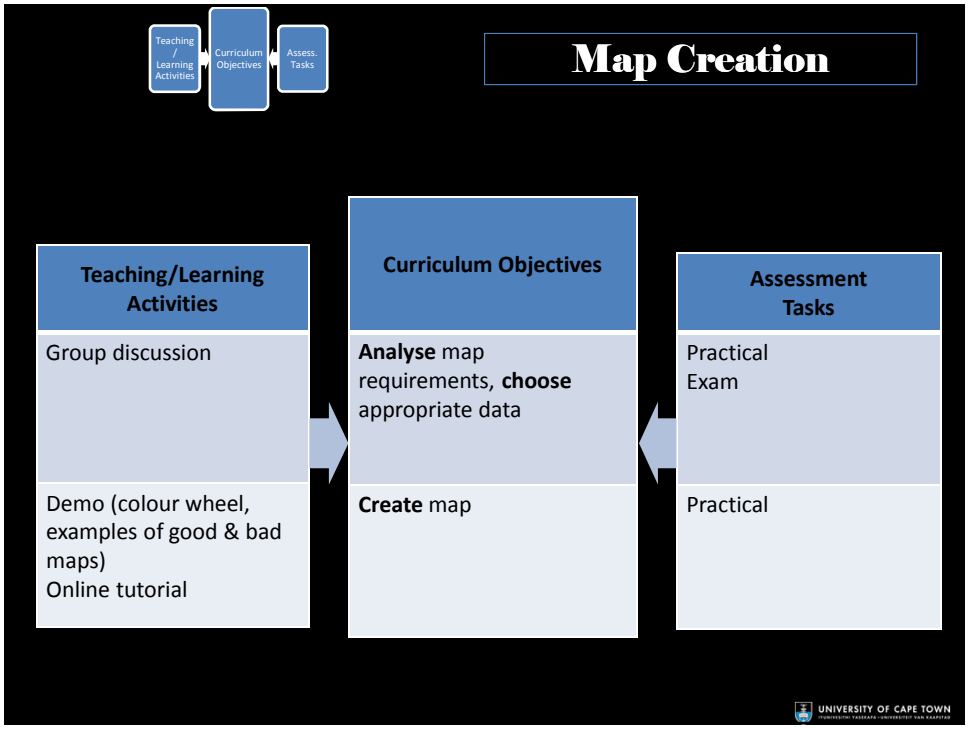
Teaching / Learning Activities
Curriculum Objectives
Assess. Tasks
Map Creation
Teaching/Learning Activities
Group discussion
Demo (colour wheel, examples of good & bad maps)
Online tutorial
Curriculum Objectives
Analyse map requirements, choose appropriate data
Create map
Assessment Tasks
Practical Exam
Practical
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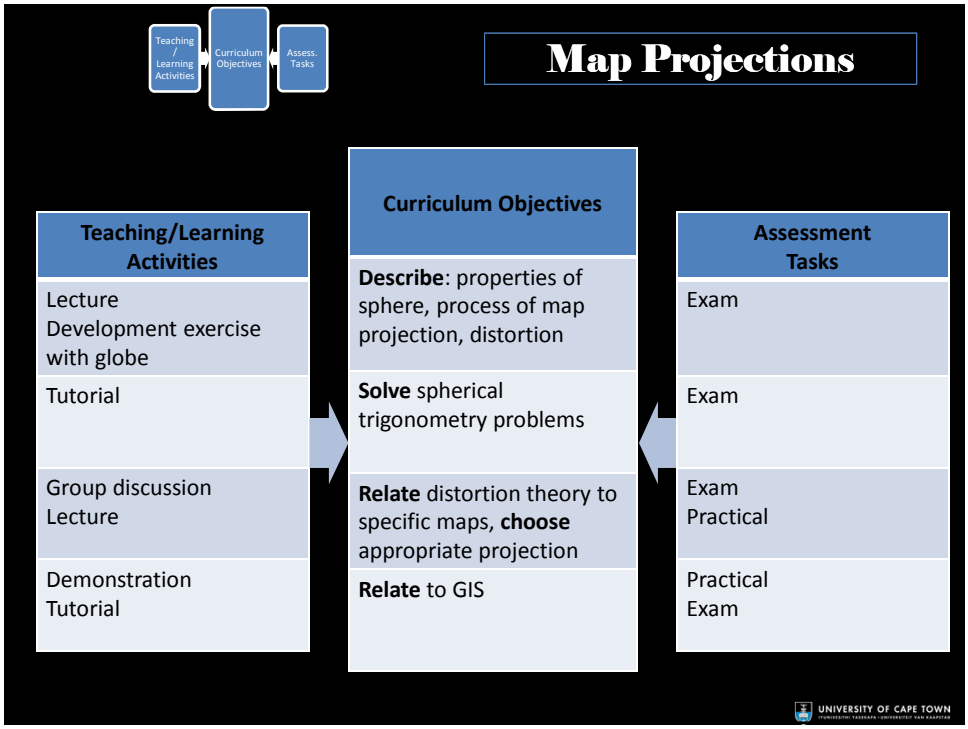
Teaching / Learning Activities
Curriculum Objectives
Assess. Tasks
Map Projections
Teaching/Learning Activities
Lecture
Development exercise with globe
Tutorial
Group discussion
Lecture
Demonstration
Tutorial
Curriculum Objectives
Describe: properties of sphere, process of map projection, distortion
Solve spherical trigonometry problems
Relate distortion theory to specific maps, choose appropriate projection
Relate to GIS
Assessment Tasks
Exam
Exam
Exam
Practical
Practical
Exam
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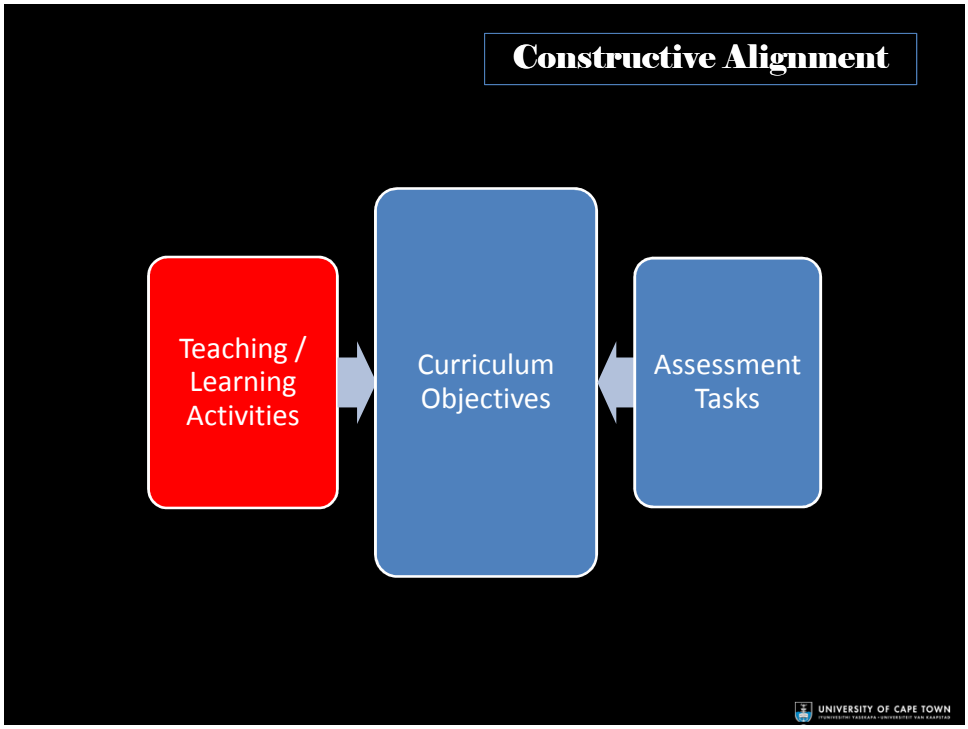
Constructive Alignment
Teaching / Learning Activities
Curriculum Objectives
Assessment Tasks
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Teaching / Learning Activities
Curriculum Objectives
Assess. Tasks
The "GIS Moment"
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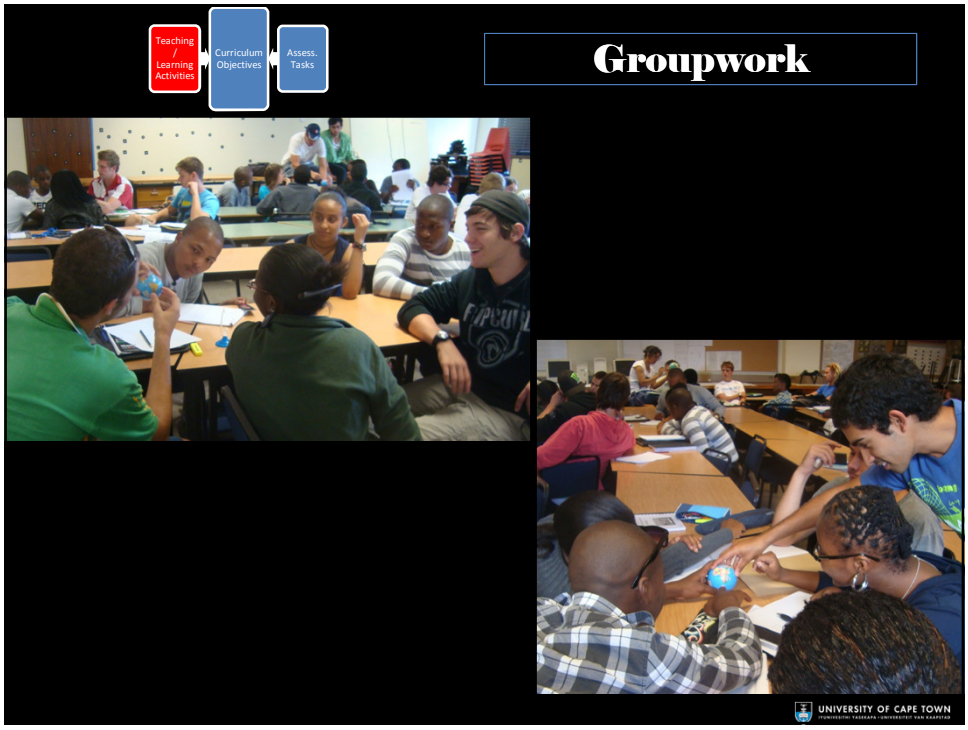
Teaching / Learning Activities
Curriculum Objectives
Assess. Tasks
Groupwork
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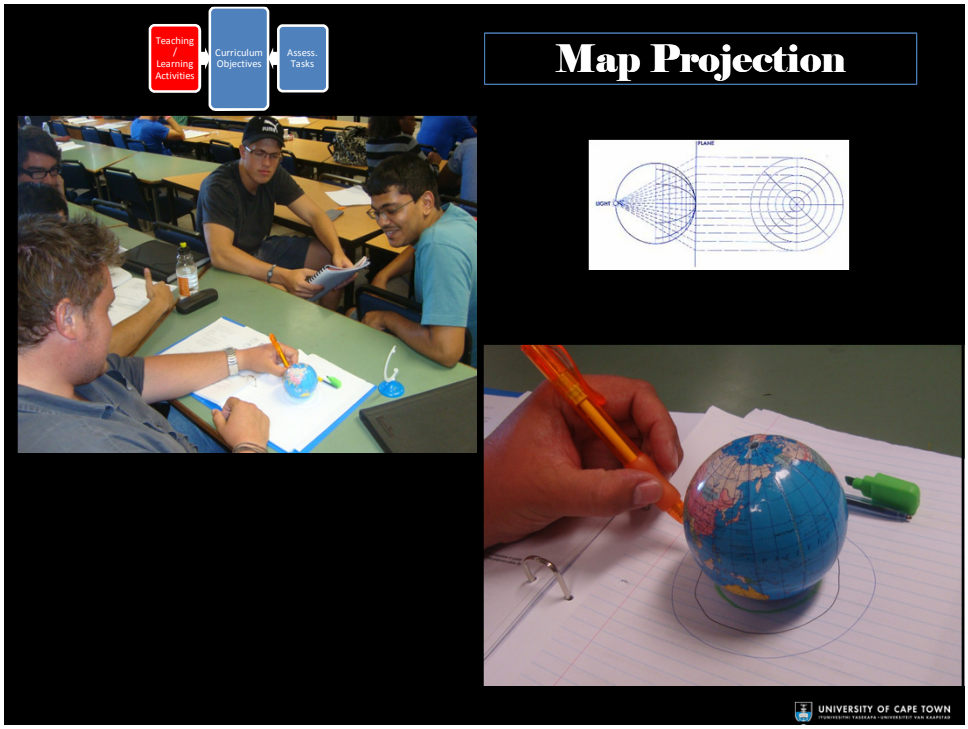
Teaching / Learning Activities
Curriculum Objectives
Assess. Tasks
Map Projection
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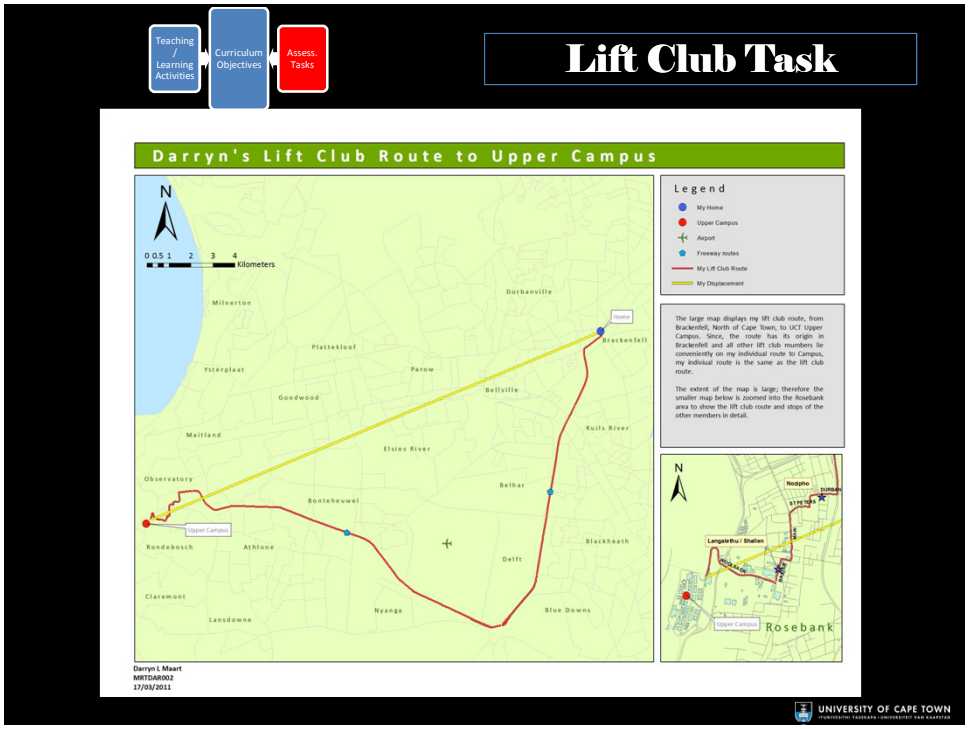
Teaching / Learning Activities
Curriculum Objectives
Assess. Tasks
Lift Club Task
Darryn's Lift Club Route to Upper Campus
Legend
My Home
Upper Campus
Airport
Freeway routes
My Lift Club Route
My Displacement
Kilometers
Durbanville
Milnerton
Brackenfell
Home
Plattekloof
Ysterplaat
Parow
Goodwood
Bellville
Maitland
Kuils River
Elsies River
Observatory
Bonteheuwel
Belhar
Upper Campus
Rondebosch
Athlone
Delft
Blackheath
Claremont
Nyanga
Blue Downs
Lansdowne
Nodpho
Langa tha / Shalen
Rosebank
Darryn L Maart
MRTDAR002
17/03/2011
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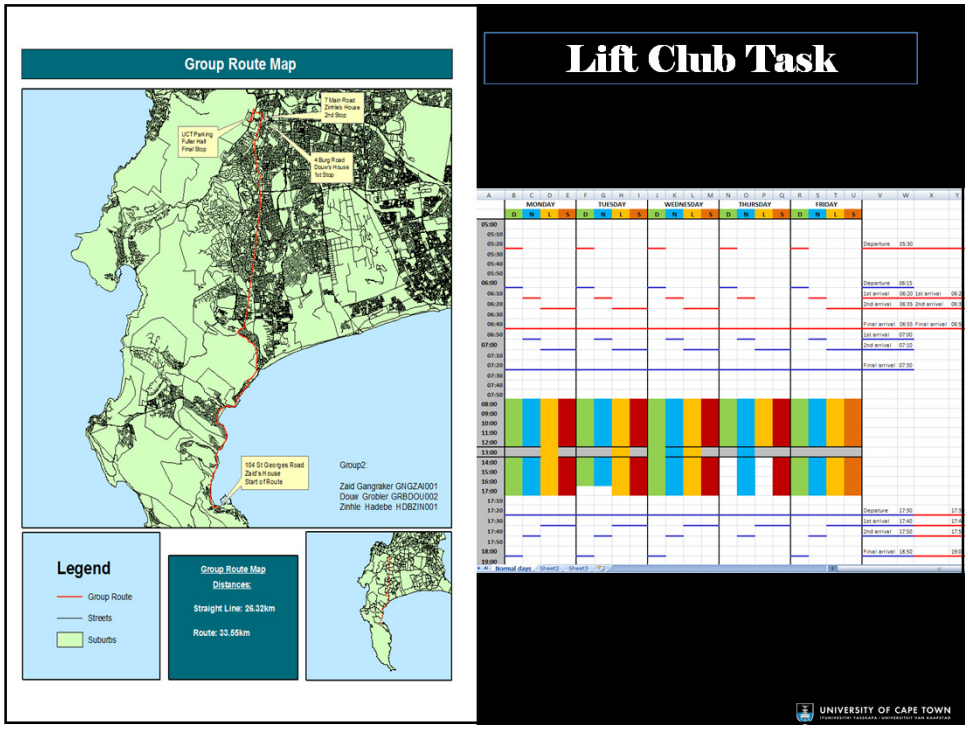
Group Route Map
7 Main Road
Zimkes House
2nd Stop
UCT Parking
Fuller Hall
Final Stop
4 Burg Road
Daan's House
1st Stop
104 St Georges Road
Zaid's H ouse
Start of Route
Group2:
Zaid Gangraker GNGZAI001
Douw Grobler GRBDOU002
Zinhle Hadebe HDBZIN001
Legend
Group Route
Streets
Suburbs
Group Route Map
Distances:
Straight Line: 26.32km
Route: 33.55km
Lift Club Task
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
FRIDAY
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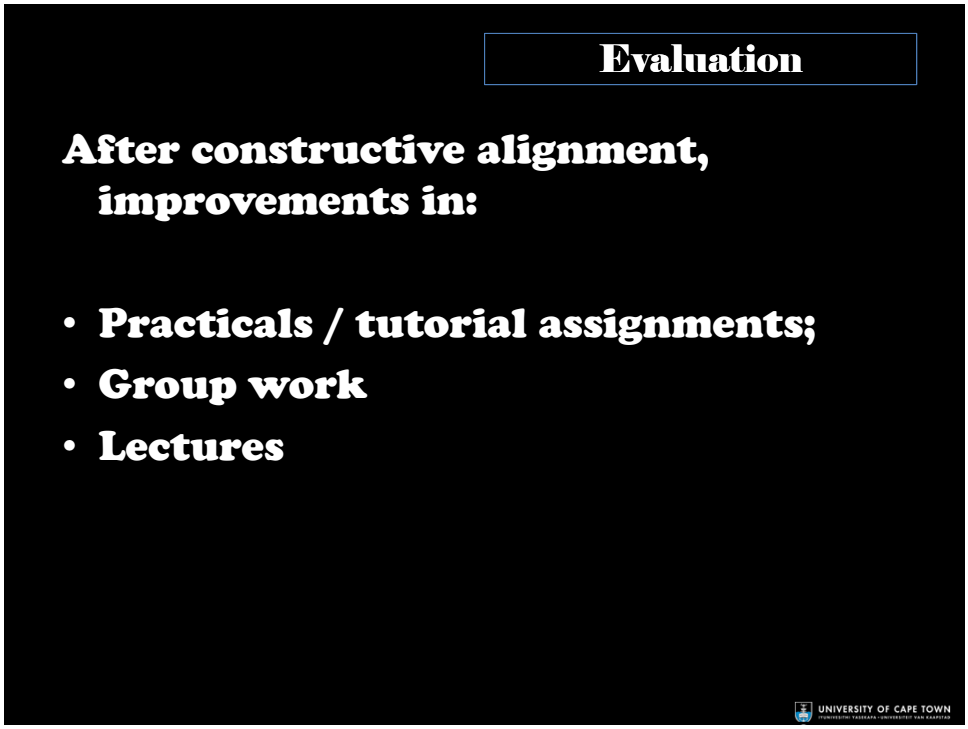
Evaluation
After constructive alignment, improvements in:
• Practicals / tutorial assignments;
• Group work
• Lectures
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Evaluation

Before Constructive Alignment:

"There is a lot of theory to learn which is actually not needed"

After Constructive Alignment:

"The discussions that we had in class was good, how to solve real problems using GIS was great"

"It was good when you showed us, when you physically did something on the GIS, so we can see how it's applied"

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Conclusion

- **Useful tool that provides guiding principles to develop students' experience**
- **Constructive alignment difficult or impossible to achieve – important to be a reflective practitioner**
- **Students must engage in activities that achieve learning outcomes**

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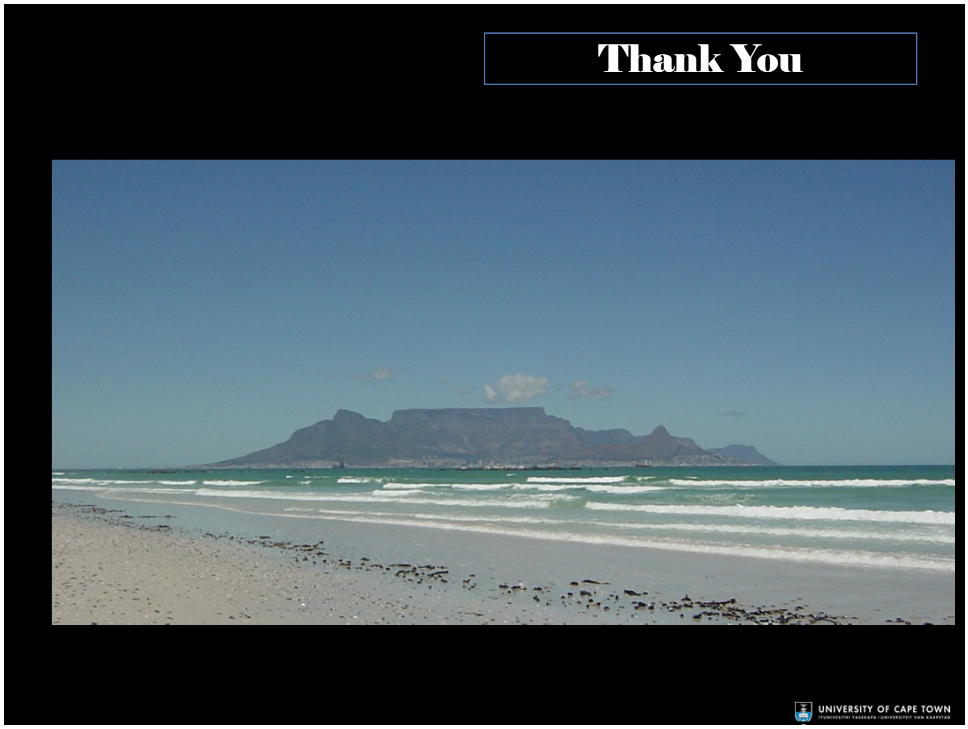
Thank You
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